PATENT SPECIFICATION

NO DRAWINGS

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Date of Application and filing Complete Specification: April 12, 1965.

No. 15391/65.

Application made in Germany (No. B76303 Ic/38c) on April 13, 1964.

Complete Specification Published Jan. 31, 1968.

Index at acceptance: —B5 L(18, B1)

Int. Cl.: —B 27 d 1/10

COMPLETE SPECIFICATION

Improvements in or relating to the Assembly of Veneers

We, BARTELS-WERKE G.m.b.H. of Langenberg, Westfallen, Germany; a German body corporate, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement: —

The present invention concerns a method and a foil strip for assembling veneer pieces edge to edge.

Several methods are known for assembling veneer pieces wherein, in the case of one method, a paper strip coated or impregnated with an adhesive is applied to the adjacently arranged veneer pieces either on the side facing the glued joint or on the external visible veneer side. Either the paper strip is glued on both sides of the joint parallel thereto or a sheet consisting of a plurality of veneer pieces is formd by several paper strips transversely to the joint pasted at spaced intervals from each other on the individual pieces of veneer.

Such a method of assembling veneer pieces has serious disadvantages which may become apparent only after the surface has been treated.

The paper pasted on the inside of the veneer, i.e. on the side of the veneer facing the glued joint, inclines to split and becomes clearly apparent upon subsequent treatment of the surface of the veneered part. In addition, only spot glueing occurs along the edges in the joints of the veneer pieces, which may have an unfavourable effect during subsequent surface treatment so that the veneer rises from the non-glued edges.

By applying the paper strip coated with adhesive to the visible side of the veneer, much better qualities of the veneered parts are achieved, because the joint, filled with the glue used on the under-layer, is bonded and closed and no splitting or marks from carrier (supporting) material can occur: However, such an application has the disadvantage that the adhesive strip on the other side of the veneer must be sanded off in a subsequent operation or removed by other means.

There is the additional disadvantage that, with the use of paper strips, the two pieces of veneer must be tightly joined together manually or mechanically by an additional force when the paper strip is applied, in order to achieve the closest joints possible betwen veneered parts.

Another method is known in which, instead of the paper strip provided with adhesive, webs of fabric or glass fibre fleeces are pasted over the joints on the side of the veneer facing the glue joint. With this method also the same marking on the surface of the veneered parts can be noticed immediately or shortly after assembly.

The carriers used in this method prevent, as in the above-described method, rapid and complete glueing of the veneered edges in the joint and require additional force in the application of the webs of fabric or glass fibre fleeces to produce tightly closed joints.

A method is also known which has a carrier-less foil prepared from animal glue, which foil is applied to the side of the wood veneer which is to be glued to the surface to be veneered. Manual or mechanical drawing together of the veneers is also necessary in this method as in the case of the paper strip method. The advantage of this method lies in the use of a bonding agent without a carrier. The disadvantage of this method is that this foil must be applied at a temperature of about 80°C, so

[*Price 4s. 6d.*]

that the glutinous film of glue is melted. In addition, in order to obtain sufficient adhesion the film of glue is coated with an adhesive of polyvinyl ethers or natural rubber.

It is therefore the object of the present invention to provide a method and a foil strip for assembling veneer pieces, which method avoids the marking of the medium connecting the pieces of veneer in the finished workpiece, and which without the application of heat and forces acting perpendicularly on the veneers in the plane of the veneer sheet, ensures a good connection of the veneers with each other and also to the surface of the workpiece to be veneered.

According to the present invention a method of assembling veneer pieces edge to edge by means of a carrier-less bonding agent comprises first placing the veneer pieces to be connected together edge to edge and then applying the carrier-less bonding agent to the resultant joints, in which the carrier-less bonding agent is a water-soluble synthetic resin which has previously been dissolved in, or swollen with, water and is in the form of threads, strips or foils.

The bonding agent is preferably polyvinyl alcohol which becomes an adhesive on swelling with water.

The necessary shrinkage forces required for achieving a tight joint between the veneer pieces are imparted by the appropriate dissolving or swelling value obtained and the type of bonding agent employed. These shrinkage forces vary with the nature of the veneer employed.

According to a further embodiment of the invention the threads, strips or foils of polyvinyl alcohol are swollen with water by 5 to 25%, preferably 6 to 8%, and are simultaneously initially dissolved. Preferably, the threads, foils or strips are wetted on one side with water at about 20°C or, if the threads, strips or foils are to be more intensively swollen, with water at a higher temperature, preferably 60 to 90°C.

According to another embodiment, the threads, strips or foils are applied to the veneer pieces in a thickness of about 0.02 to 0.10mm. and, in the case of the application of strips or foils, with a width of about 6 to 20mm. It is thereby possible, due to the different width or thickness of the synthetic resin employed, to vary its shrinkage forces according to the desired conditions. The threads, strips or foils can be pasted on the veneer pieces preferably parallel to one another.

To apply the interconnected veneer pieces to the workpieces to be veneered, cold, warm or heat setting glues dissolved or soluble in water can be used which are preferably applied to the base layer.

The method of the present invention compared with previous methods known for assembling veneers, has considerable advantages. Compared with the previously known methods for assembling veneer pieces, the most important advantage of the new method is that by using a water soluble bonding agent which dissolves in or is swellable in water, and which shrinks with loss of its dissolving or swelling water during the setting, it is possible to obtain a veneer sheet by the bonding of the individual veneer pieces without additional forces and without heat being necessary.

The resulting shrinkage strain makes it possible, without manual or mechanical assistance to obtain tightly closed joints and at the same time, due to the cracking of the bonding agent during the supply of moisture to its particularly endangered cross section—the joint, by penetration of the glue applied to the base layer, to obtain indirect glueing of the joint. A further advantage results from the high resistance to dry cracking of the polyvinyl alcohol bonding agent preferably used according to the invention.

A further advantage of the new method is that, by the use of a water soluble synthetic resin as bonding agent for holding the veneers together, no sign of the bonding agent applied to the veneer side facing the glue joint ocurs upon subsequent surface threatment because, when the veneer pieces connected together in the form of veneer sheets are applied to the work pieces to be veneered, the carrier-less water soluble bonding agent swellable with water together with the cold, warm or heat setting glue dissolved in water or soluble in water used for connecting the veneer sheet to the surface of the workpiece to be veneered, has united to form a homogeneous unit.

Depending on the nature of the glue employed, it is possible, by a perforation of the foil strip, to accelerate this process. A carrier-less polyvinyl alcohol foil may very favourably be used as a strip and be provided with perforation of 0.1 — 40% area, calculated relative to the surface of the strip, preferably 8 — 20%.

As a strongly shrinking foil (strip, or thread) plastic foils on a base of strongly swelling and strongly shrinking polyvinyl alcohol are preferred, a mixture of various polyvinyl alcohols of different degrees of polymerisation and/or acetylation, and having a low viscosity being used as raw material.

In the presence of urea glues which are mainly used as glues for veneering, the further advantage exists that the preferred polyvinyl alcohol is influenced by components in the urea glue, such as formaldehyde and ammonium chloride with the action of heat during the veneering, in respect of reduction of its water swelling properties

after the application and, consequently its water resistance, in a very favourable manner.

The method of the present invention will be explained in greater detail below with reference to two examples:

EXAMPLE 1

Pairs, or a plurality, of veneer pieces to be connected are first arranged with their longitudinal edges in adjacent parallel relationship so that for example, the sides which are to be subsequently glued on to the work piece to be veneered lie face upwards. A foil of polyvinyl alcohol or a band with a thickness of 0.02 — 0.10 mm and a width of 6—20 mm is swollen with water on one side to about 6—10%. Then the swollen polyvinyl alcohol which is now an adhesive is mechanically or manually applied to the veneer pieces to be connected, with the use of a slight pressure. The swollen polyvinyl alcohol foil draws the veneers together with a tight joint due to shrinkage.

According to a preferred method with the use of mechanical operation, the prefabricated foil or strip is wetted with water on one side, the water being at 20°C or higher, more particularly just before application to the advantage that, during continuous manufacture, the moistening device for example, a sponge is in the direct vicinity of the veneered pieces before the foil is applied, and with the feed of the veneer or foil stationary, is raised from the foil or strip, or alternatively the strip or foil is raised from the sponge. This avoids breaking away due to the complete detachment of the foil. It is natural that a higher moistening temperature of 60—90 degrees C effects a more rapid and intensive swelling of the foil and consequently an increased shrinkage force after adhesion.

EXAMPLE 2

The individual veneer pieces are arranged in the above stated manner adjacent to each other by their sides which are subsequently to be in contact with the surface of the workpiece to be veneered, aligned upwardly or joined together. Then the bonding agent, preferably polyvinyl alcohol, is stirred with water into a viscous solution. This viscous solution is poured out in a sheet or in the form of individual webs, parallel to or crossing each other, on the adjacent veneers.

By separating the water from solution into the wood or evaporating the solvent, e.g. water into the surrounding atmosphere, tightly closed joints are formed with shrinkage and at the same time a film, thread or the like connecting all the veneer pieces and extending according to the manner of application, is obtained over the joints. Of course this drying or shrinking process with consolidation into a foil, thread or the like, can be increased by the use of a solution of the bonding agent heated to 90—100°C a feature, however, which in no case will always be necessary. During the subsequent application of the veneer sheet consisting of individual pieces connected together by means of the shrunk material, to the surface of the workpiece to be veneered with the use of a glue dissolved in water, there is formed from the water-containing glue and the bonding agent of the veneer pieces, a homogeneous glue film hardening according to the nature of the glue and firmly connecting the veneer sheet to the surface of the workpiece.

During the subsequent bonding of such a veneer sheet to the surface of a workpiece to be veneered, by means of a water-containing glue, it is possible, by specially rapid loosening of the foil in the area most greatly stressed by the shrinkage forces, i.e. the joint, to cause the glue applied to the lower layer, i.e. to the surface of the workpiece to penetrate into the joint and to connect the two pieces of veneer together.

No special temperature range is necessary, due to the water solubility of the synthetic resin employed, particularly polyvinyl alcohol. Cold, warm or hot setting glues dissolved in water can be used to apply the veneer sheets to the veneer base, a close bonding therewith being achieved on account of its moisture.

WHAT WE CLAIM IS:—

1. A method of assembling veneer pieces edge to edge by means of a carrier-less bonding agent comprising first placing the veneer pieces to be connected together edge to edge and then applying the carrier-less bonding agent to the resultant joints, in which the carrier-less bonding agent is a water-soluble synthetic resin which has previously been dissolved in, or swollen with, water and is in the form of threads, strips or foils.

2. A method of assembling veneer pieces edge to edge as claimed in claim 1 in which the bonding agent is polyvinyl alcohol which becomes an adhesive on swelling with water.

3. A method of assembling veneer pieces edge to edge as claimed in claim 2 in which the threads, strips or foils of polyvinyl alcohol are swollen with water by 5 to 25%, preferably 6 to 8%.

4. A method as assembling veneer pieces edge to edge as claimed in any preceding claim in which the threads, strips or foils are wetted on one side with water at about 20°C.

5. A method of assembling veneer pieces edge to edge as claimed in any one of claims 1 to 3 in which the threads, strips or foils are wetted on one side with water at 60 to 90°C.

6. A method of assembling veneer pieces edge to edge as claimed in any preceding claim in which the threads, strips or foils are applied to the veneer pieces in a thickness of 0.02 to 0.10mm and, in the case of the application of strips or foils, with a width of 6 to 20mm.

7. A method of assembling veneer pieces edge to edge as claimed in claim 1 substantially as hereinbefore described with reference to the Examples.

8. A foil strip for assembling veneer pieces edge to edge comprising a water-soluble synthetic resin which is capable of being dissolved in, or swollen with, water.

9. A foil strip for assembling veneer pieces edge to edge as claimed in claim 8 in which the synthetic resin is polyvinyl alcohol.

10. A foil strip for assembling veneer pieces edge to edge as claimed in claim 9 in which the polyvinyl alcohol used is of low viscosity.

11. A foil strip for assembling veneer pieces edge to edge as claimed in claim 8 in which the synthetic resin comprises a mixture of polyvinyl alcohols having different degrees of polymersiation and/or acetylation.

12. A foil strip for assembling veneer pieces edge to edge as claimed in any of claims 8 to 11 in which the strip is provided with perforations from 0.1 to 40% area, calculated relative to the surface of the strip.

13. A foil strip for assembling veneer pieces edge to edge as claimed in claim 12 in which the strip is provided with perforations from 8 to 20% area.

14. A foil strip for assembling veneer pieces edge to edge as claimed in claim 8 substantially as hereinbefore described with reference to the Examples.

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Leamington Spa: Printed for Her Majesty's Stationery Office by the Courier Press.—1968.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.